

11.2 Displaying Data





Goals for the Day

1

Frequency
Tables
(Distributions)

2

Graphical
Displays of
Data

1

Frequency Tables (Distributions)



Frequency Tables (Distributions)



Summarize datasets by counting the number of observations for each category, distinct value or interval.

Can be used for categorical data and quantitative (numerical) data.

Type of Computer	Count Frequency	Relative Frequency Percent
Desktop	11	$11/50 = 22\%$
Laptop	23	$23/50 = 46\%$
Notebook	9	$9/50 = 18\%$
Tablet	7	$7/50 = 14\%$

Total = 50

Number of Pets	Frequency
1	4
2	3
3	2
4	1
5	2
6	1
7	1
8	1

Grouped Frequency Distribution

Number of Pets	Frequency
1-2	7
3-4	3
5-6	3
7-8	2

Find count between 4 and 7 inclusive: 4, 5, 6, and 7



Example 1



Construct a frequency table using the data below.

38, 33, 5, 5, 47, 29, 24, 42, 3, 18, 30, 46, 25, 44, 40, 42, 39, 44, 29, 13

	Class	Frequency	Relative Frequency
Lower class limit = 0 Upper class limit = 9	0-9	3	$3/20 = 0.15$
	10-19	2	$2/20 = 0.1$
	20-29	4	$4/20 = 0.2$
Class width = $\text{Lower}_2 - \text{Lower}_1$ $10 = 40 - 30$	30-39	4	$4/20 = 0.2$
	40-49	7	$7/20 = 0.35$
	Total:	20	$20/20 = 1$

2

Graphical Displays of Data

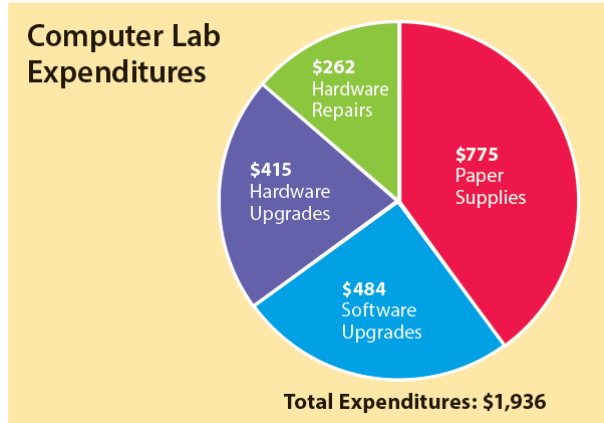


Pie Charts



Pie Charts

- Compare parts to a whole.
- Slices represent the proportion of a category



Type of Data: Categorical

Advantages:

- * Simple and common

Disadvantages:

- * Harder to compare area than heights
- * Not useful when there are lots of categories
- * Easy to be misleading if visually distorted (3D, one slice is larger) or labels are not clear)

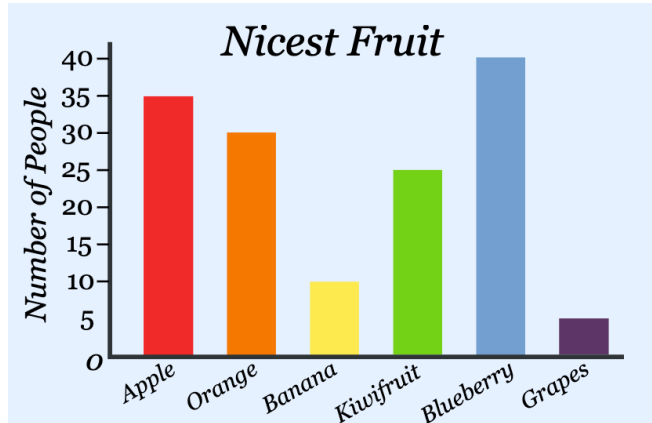


Bar Graphs



Bar Graphs

- Height of the bar represents the amount of data in each category.
- Can be counts or relative frequencies.



Type of Data: Categorical

Advantages:

- * Simple and common and easy to read

Disadvantages:

- * Misleading if:
 - Bars are not equal width
 - Inconsistent vertical scale
 - Vertical scale is truncated (not start at 0)

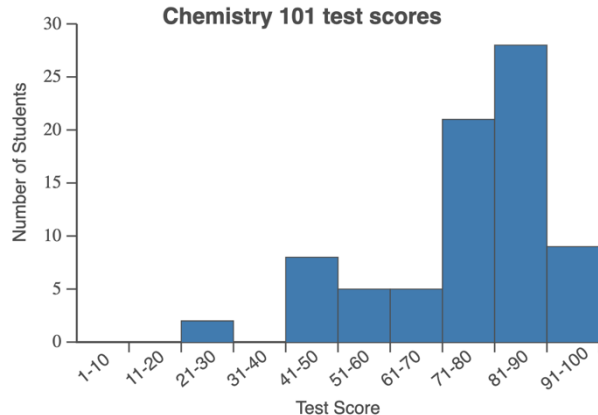


Histograms



Histograms

- Height of the bar represents the amount of data in each class.
- Can be counts or relative frequencies.



Type of Data: Quantitative

Advantages:

- * Simple
- * Can show lots of data very concisely
- * Shows “shape” or distribution of data

Disadvantages:

- * Class width impacts the plot drastically
- * Misleading if:
 - Bars are not equal width
 - Inconsistent horizontal / vertical scale
 - Vertical scale is truncated (not start at 0)



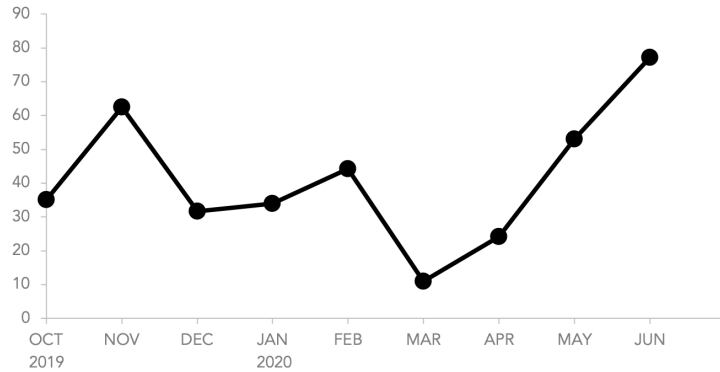
Line Graphs



Line Graphs

- Shows changes in a numerical variable over time.

Produce sales
IN THOUSANDS (USD)



Type of Data: Quantitative

Advantages:

- * Shows trends over time

Disadvantages:

- * Misleading if:
 - Inconsistent horizontal / vertical scale
 - Vertical scale is truncated (not start at 0)

Good Graphs



- **Good Graphs:** A clear graph should have a title, labels on the vertical and horizontal axis, and should reference the source of the data.